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LOAN RECOVERY IN BANGLADESH: AN EMPIRICAL STUDY USING RURAL BANK BRANCH DATA

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Introduction

Concessionary rural credit programs are often perceived as a means of reducing poverty and increasing rural productivity in many low income nations. Unfortunately, these programs have a history of default and delinquency. The inability of financial institutions (FIs) to recover concessionary loans endangers their long-term viability. At the same time, defaults also restrict the availability of funds for lending to new borrowers or to current borrowers who are in good standing. Funds for new loans must then come from the government or from donors. As a result the FIs further distance themselves from their customers (both depositors and borrowers) and increase their dependency on outside funds.

Much of the early literature addressing the loan recovery problem concentrated on loan recipient characteristics or farm level causes, and largely ignored the FIs' role in the recovery process. Defaults were often explained by the borrowers' inability or unwillingness to repay loans [Donald].[1] Borrowers were considered unable to repay loans either because they mis-allocated the funds borrowed or the funded activity did not generate sufficient funds for repayment. It was often argued that subsidized loans were mis-allocated for consumption rather than for production purposes; i.e., to cover costs of

[1] A more detailed discussion of these studies is presented in Boakye-Dankwa; Christen; Montiel; and Von Pischke 1980.

celebrations, illnesses, funerals or other social expenses, or to repay loans previously obtained from moneylenders. This so-called non-productive use of subsidized credit was one of the first explanations given for high rural default rates. A second reason centered on the borrowers' inability to generate sufficient income to repay their loans, often because they were too poor. These explanations were associated with acts of God (floods, drought, pestilence) and/or related to the absence of profitable investments in agricultural production (often due to the price control policies enacted by the government), inefficient markets, poor planning and low educational levels.

Other delinquent borrowers were identified as being unwilling to repay their loans even though they had sufficient funds for meeting their contractual obligations. Causes for willful default were frequently associated with a political environment that led borrowers to think of subsidized loans as gifts rather than as loans requiring repayment. Borrowers perceived these "loans" as gifts in return for supporting a particular regime or candidate. Wealthier borrowers were able to intimidate bank officers, legal officials, judges, and the FI's board of directors and, thus, ignore the repayment of their loans. These borrowers are usually recipients of large loans. The lack of ethical stimuli encouraging loan repayment, of legal sanctions to punish defaulters, of loan supervision by FIs, and the high costs FIs faced in attempting to punish defaulters were other factors identified as contributing to willful default.

By the late 1970s, however, the concepts of Shaw and McKinnon concerning the importance of finance in development gained acceptance and researchers studying loan recovery began to turn their attention from the behavior of borrowers to the actions of lenders. This led to the view that "the failures of subsidized rural credit are frequently

laid at the feet of the institutions that were created to manage it" [Braverman and Guash, p. 1253]. Poor recovery was linked to institutional factors such as the low interest rates charged on targeted loans, the high transactions cost and credit rationing caused by interest rate ceilings, the absence of savings mobilization in many FIs, the reliance on outside funds (national treasuries or foreign donors) for loans, the practice of basing loan size on production cost formulas rather than on borrower debt capacity, and rewarding loan officers for the volume of loans made rather than for the quality of loans made. Researchers also began to argue that solutions to recovery problems were more likely to be found in institutional reform rather than by individual defaulter repentance [Christen; Cuevas and Graham; Montiel; Takroni; Van Steenwyck]. For example, one author reported that financial institutions lending their own deposits have better recovery rates than institutions dependent on outside sources of funds [Christen]. Another study concluded that issues concerning willful default are better addressed through actions to increase the lender's willingness to collect rather than through the borrower's willingness to repay [Maharjan, et. al.].

This paper reports on an attempt to test the degree to which factors associated with FI collection efficiency affect loan recovery. Although a causal relationship is difficult to prove, bank factors are important since they "set the groundwork in providing the farmers the opportunity to repay their loans" [TBAC, p. 35]. Few empirical studies have addressed this topic.

In this study, Bangladesh bank branch data are analyzed following the approach used in a study conducted by the Technical Board for Agricultural Credit (TBAC) of the Philippines. This Bangladesh study is particularly relevant because it utilizes a

representative sample of public bank branches operating in rural areas. These branches are owned and operated by the agricultural development bank (BKB) and four nationalized commercial banks (NCBs). All of these banks were regulated by a supply-leading credit policy that assigned a volume of loans that banks were encouraged to make during the year. The paper opens with a brief discussion of lending and recovery of rural loans by the Bangladesh financial system. The remainder of the paper describes the data, the model specification, and the empirical results. It concludes with a brief summary of the major findings.

Lending and Recovery of Rural Loans in Bangladesh

The Bangladesh financial system is made up of an extensive branch banking network. Presently four nationalized commercial banks (NCBs) and the agricultural development bank (BKB) hold the largest share of formal loans and deposits in the rural financial system [Srinivasan and Meyer, 1987]. During the second half of the 1970s, the government made a concerted effort to increase the flow of formal credit to rural areas. First, these public banks were required to open two rural bank branches for each urban branch created. Secondly, the government implemented subsidized loan targeting programs, whereby the Bangladesh Bank (the central bank) assigned each bank an amount of credit to be disbursed during the year [Ahmed]. Banks lending under this program were granted access to the rediscount window of the Bangladesh Bank.

These efforts resulted in a rapid expansion of the country's rural banking system. The number of rural bank branches increased from about 500 in 1975 to over 3,000 in 1984. Proportionally, rural branches grew from almost half of the total bank branches in 1975 to two-thirds in 1984. At the same time, the nominal volume of agricultural

credit disbursed per year increased from $ 57 million to almost $ 462 million between these years. Concurrently, the nominal volume of rural deposits mobilized increased from $ 106 million to $ 489 million or from eight percent of total bank deposits to 17 percent during this period [Ahmed]. The rural loan disbursal process was further accelerated by the creation, in the early 1980's, of local credit committees, Upazila Agricultural Credit Commissions (UACCs). Each UACC was comprised of local politicians and elites with the participating branch manager served as its recording secretary. Upon receipt of an UACC approved loan application, the branch was required by law to disburse the loan funds within a week.

Several factors help explain the poor recovery experience of rural branches disbursing agricultural loans. First, the branches tended to be understaffed compared to the volume of loans disbursed. Branch personnel have been poorly trained in the supervision of agricultural loans. The majority of their training emphasized the proper documentation procedures for disbursing loans rather than emphasizing appropriate recovery procedures [Ahmed]. Secondly, recovery efforts were hindered by the UACCs in two ways: the committees ignored the branch personnel's acquired skills in the borrower selection process for short-term agricultural loans; and, the UACCs assumed no responsibility for the recovery of the loans they approved. Loan recovery was the responsibility of the branch disbursing the loan [USAID]. Consequently, the branch officers had no leverage over UACC members to ensure that funds were disbursed to creditworthy borrowers. By 1986 these commissions ceased functioning and branch personnel once again gained full responsibility for selecting their borrower clientele.

Since 1984, the level of loan delinquency and default in Bangladesh accelerated in large part due to government loan and interest forgiveness programs [Navin].

Bangladesh banks report interest earnings on an accrual basis rather than the actual interest payments received. Regulators do not appear to enforce writing-off old, inactive loans; therefore, these loans remain classified as outstanding so bank income is inflated by large amounts of accrued interest. These accounting procedures cloud the magnitude of the banks' recovery problem, since defaulted loans are maintained for their income generating properties. Consequently, the volume of loans outstanding of banks operating in this type of regulatory environment should not be used as a proxy for their loan portfolio. Almost all the sampled branches had operating expenses higher than their operating income. However, over three-quarters of them reported positive net incomes, implying that their reported interest income was greater than their interest expenses.

Seven years of official recovery data for agricultural loans in Bangladesh are presented in Table 1. These recovery rates measure amounts recovered during the year as a percentage of the amounts coming due during the year plus overdues including principal and interest due, i.e., the collection ratio. During this period the banking system as a whole recovered less than half the amount of loans coming due and overdue. The bank-wide recovery position peaked in 1980/1981 with a reported recovery rate of 49 percent. Clearly the vitality of the rural, if not the entire, financial system in Bangladesh is threatened by widespread loan defaults. It is reported that the better recovery position of BKB over the NCBs can be explained, in part, by a practice of refinancing overdue loans (old loans were repaid using funds from newly disbursed loans).

During 1984/85 this practice was stopped and consequently the BKB's recovery position suffered [Gregory and Adams].

Table 1: Official Agricultural Loan Recovery Position by Bank and by Year*

Bank	Year							
	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86
	(Percent)							
Agrani	41	30	27	28	34	37	37	24
Janata	53	32	35	39	43	33	32	25
Rupali	25	23	15	34	10	25	17	14
Sonali	48	36	38	31	37	39	32	22
BKB	54	56	68	68	50	50	44	31
Total	45	42	49	48	42	42	38	26

* Recovery is measured as loan payments received (LR) by the bank during a given period as a percent of loans due during that period (LD) plus previous overdues (LPD). Symbolically this percentage is LR/(LD+LPD).

Source: Bangladesh Bank, Agricultural Credit Department. Unpublished data.

Data Used

This study of loan recovery utilizes survey data collected during late 1985 and early 1986 from branch managers in 101 rural branches. It was part of the research conducted under the Rural Financial Markets project of United States Agency for International Development (USAID), and was titled the Rural Bank and Bank User Survey (RBBUS). The data were collected from branches located in the eight major political divisions utilized prior to 1983. The branches represent a stratified random sample of approximately 3,300 rural branches operating in Bangladesh when the survey was designed. Owing to missing values, the number of branches included in the models

tested was 82.[2] The distribution of branches of the four NCBs include: Agrani Bank--17 branches; Janata Bank--11 branches; Rupali Bank--6 branches; Sonali Bank--24 branches. Information from 24 BKB branches was included in the models.

The survey collected portfolio information from each branch on the loans made during the years 1979 to 1984. However, the survey only contained deposit information for 1984. Since the loan-to-deposit ratio is utilized as an explanatory variable for the models estimated in this paper, only the data for loans made during 1984 were utilized. Rural bank branches in Bangladesh also make non-agricultural loans; thus, the survey divided a branch's loan portfolio into the two categories of agricultural and non-agricultural loans. Agricultural loans represented 85 percent of the outstanding loans in an average branch's portfolio [Table A]. Unfortunately, the data base lacks information concerning the amount of loans coming due each year and the value of the portfolio's overdue loans. These shortcomings resulted in a less than desirable definition of the collection ratio for the recovery measure. This problem is discussed in the following section.

Specification of Variables[3]

Two loan recovery measures representing amount recovered and some form of recovery ratio are generally reported by financial institutions. Both recovery measures will be used as dependent variables in the models developed in this study. The first dependent variable shows the amount of funds recovered and was measured in two ways:

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[2] Seven of the 101 branches did not make loans during 1984 and were excluded from the analysis.

[3] Descriptive information of the variables included in the models are presented in Table 2.

AG_VOL_COLL, measures the volume of agricultural loans collected by the branch, and the second, **TOT_VOL_COLL**, measures the amount collected for all loans in the portfolio. The volume of funds recovered includes all payments received during the reporting period; i.e., overdue loan principal, interest and penalty payments; due loan principal and interest payments; and, the early payment of loan principal and interest. A total of Tk. 24.3 million were recovered by the 82 branches during 1984[4] of which 87 percent were agricultural loan repayments. The average amounts recovered by these branches was Tk. 980,000 and Tk. 1,429,000 for agricultural and total loan payments received, respectively. The median amounts recovered were substantially lower than the average: Tk. 569,000 and Tk. 793,000, respectively. The disparity between the mean and median amounts recovered imply that some branches were collecting sizable repayments while others were not, thus skewing the distribution of these variables [Cookson].

The second recovery measure, the collection ratio, suffers from a great variation in definition and measurement across studies. The numerator of the ratio is defined as some form of payments received by the FIs, while the denominator measures the amounts owed for repayment during the reporting period. The lack of a consistent definition for this ratio among FIs makes it virtually impossible to do straight forward comparisons of the recovery position between different countries or even between FIs operating in the same country. For example, the collection ratio utilized by the TBAC study compares the loans collected to the loans granted during the period under study. The Bangladesh Bank Agricultural Credit Department's (ACD) definition of the collection

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[4] Taka (Tk.) is the monetary unit of Bangladesh. It means rupee in Bengal. The average 1984 exchange rate was $1 = Tk. 24.88.

ratio is payments received during the period, or the recovery amount, divided by the loans and charges due and past due for the reporting period. Both the numerator and denominator include interest and penalty payments and charges in addition to the loan principal.

The difference between the TBAC and the ACD collection ratios illustrates the difficulty of trying to compare the ratios of two different FIs. The numerator of the TBAC measure contains interest payments while the denominator does not. Consequently, for a FI included in the TBAC study to have 100 percent recovery of its funds due, its collection ratio would have to be greater than one, since the numerator includes interest payments. The ratio would be even larger if overdue loan payments were also received during the reporting period. It is not uncommon for financial intermediaries to manipulate these definitions or choose the one that will reflect the best or highest possible recovery position.

In addition to the issue of whether or not interest earnings should be included in the collection ratio (if they are, they need to be included in both the numerator and the denominator of the ratio), other questions that arise when interpreting this ratio include: Are rescheduled loans included in the numerator and removed from the denominator? Are loans in arrears included in the denominator? How are prepayments treated? All these factors affect the calculation of the collection ratio and may cause the reporting institution to present a distorted recovery position. In addition, if past overdues represent a large proportion of a bank's loan portfolio, its reported recovery rate will decline even though it may be recovering its current loans as they come due. For the collection ratio

to be a meaningful measurement technique, it must be accompanied by a policy of writing-off old overdue loans [Von Pischke 1977].

This study was unable to utilize the ACD collection ratio because information concerning loans coming due, overdue loans and interest payments due was not available from the sampled branches. Consequently, the collection ratio employed by the TBAC study, funds recovered divided by funds disbursed, was utilized as the second dependent variable of the estimated models. **AG_REC_RATE** is the ratio of payments received to amounts disbursed during 1984 for agricultural loans alone. The second ratio, **TOT_REC_RATE**, is the ratio of total amount of payments received to total amount disbursed for all loans during the year, which is equivalent to the TBAC collection ratio of the branch's loan portfolio.

The mean values for **AG_REC_RATE** and **TOT_REC_RATE** are .49 and .50, respectively. The national average for **AG_REC_RATE** in 1984 was .44 [unpublished ACD report]. The median values for these two variables are lower, .29 and .34, respectively. Only nine branches had recovery ratios greater than one. However, these branches reduced the amount of credit they disbursed during 1984, thus distorting their collection ratio. The low recovery rates of the 82 branches, based on this poor recovery measure, further accentuates the non-sustainability of the Bangladesh rural banking system without outside funding.

The collection performance of a branch will be partially explained by the following factors: the number of agricultural loans disbursed during the period (**#_AG_LNS**), the value of agricultural loans outstanding including overdue loans and the interest due for the end of the period studied (**AG_LNS_OUTS**), the manpower resources or personnel

of the branch (**PERS**), the age of the branch (**BR_AGE**), the years of banking experience of the branch manager (**BM_EXP**), the loan target amount assigned to the branch (**TARGET**), and the branch's operating efficiency. Three different branch financial ratios, loans to deposits (**LNS_TO_DEP**), operating income to operating expense (**OPY_TO_OPEXP**) and net income to gross income (**NETY_TO_GRSY**), as well as the branch's net income (**BR_NET_Y**), were used to measure branch operating efficiency. Finally, a dummy variable (**BANKTYPE**) was included to test whether the collection efficiency of the NCB branches was significantly different from the BKB branches, where BANKTYPE=1 represents a NCB branch. Based on ACD data, the expected sign of the coefficient of this variable is negative.

Short-term agricultural loan recipients represent the majority of borrowers in branch loan portfolios [Gregory and Adams]. While the bank personnel spent little time in borrower selection for short-term agricultural loans, time and effort were spent in filling out borrower information forms, disbursing and recording the loans, interest accumulations and payments, as well as filling out reports required by head offices and foreign donors. The more agricultural loans a branch makes, the less time branch personnel have to devote to recovery activities. Consequently, the more loans a branch makes during the year, the poorer its recovery position may be, or, **#_AG_LNS**'s estimated coefficient would have a negative sign. On the other hand, small agricultural borrowers have been shown to often have better repayment records than do larger borrowers. One explanation is their lack of political clout, so they cannot coerce bank personnel into granting them new loans while still delinquent on old ones. Another reason is that small borrowers are more apt to repay their loans to maintain their

eligibility for future loans [Christen; Cookson; Maharjan, et. al.; Montiel]. Based on these findings, the sign of **#_AG_LNS**'s estimated coefficient may be positive. The sample median for this variable was 482 loans disbursed during 1984 while the mean was 739 loans. The number of loans disbursed by the 82 branches during this period ranged from five to 3,259 loans.

The recovery success of a branch may be measured by the value of a its outstanding agricultural loans (**AG_LNS_OUTS**). Since branches rarely write-off bad loans, old overdue loans remain on the branches' balance sheets as outstanding. Overdues represent at least one-third of the loans outstanding for the combined five banks surveyed in this study [unpublished ACD report]. Therefore, a negative sign for the **AG_LNS_OUTS** coefficient may imply that the sample branches do not have much success in recovering their agricultural loans. The sign is uncertain for the models using the volume collected dependent variables (AG_VOL_COLL and TOT_VOL_COLL). The value of outstanding agricultural loans ranged between Tk. 15,000 and Tk. 29,721,000 for the sample as a whole.

The Philippines study reports that "there is evidence that the number of personnel is a determinant of loan repayment. Employing a greater number of personnel seems to have a favorable effect on past due and repayment rates..." [TBAC, p. 91]. Other studies have reported that better recovery is achieved by more loan supervision and by banks providing reminders to borrowers that loans are due or past due [Kim; Maharjan, et. al.]. These steps require a sizeable amount of time; therefore in order to increase recovery levels more branch personnel may be required so the sign of the estimated **PERS** coefficient is expected to be positive. At the time of the survey, the number of

branch personnel was largely a function of deposit mobilization rather than the total size and number of loans and deposits. The number of people working in the sampled branches ranged between 4 and 35 people.

The average age of the sampled branches was eight years while their median age was seven years. Overall, the ages of the branches included in this study ranged from two to 21 years of operation. The longer the branch is in operation, the broader is its customer base. Over time, the community becomes better acquainted with the financial services the branch offers and branch personnel collect saving and spending information on potential borrowers. Therefore, a branch's age is hypothesized to positively influence loan collection.

The same is true for the number of years the branch manager has in banking, **(BM_EXP)**, i.e., the branches of more experienced managers are expected to have better recovery rates. For the sample, the branch managers had an average 6.5 years of experience while the median was 6 years of banking experience. Overall, the sampled branch managers had between one and 18 years experience.

The branch's assigned loan target **(TARGET)** was included in the models since the greater the target volume, the more time and effort branch personnel must expend on loan disbursal and the less time they have to devote to loan collection. The loan target is hypothesized to be negatively related to loan recovery. The loan targets assigned to the sampled branches ranged between no loan target and Tk. 27,772,000. The sample average loan target (Tk. 3,687,000) was more than three times as large as the median value.

The loan-to-deposit ratio (**LNS_TO_DEP**) is the first management efficiency variable included in the model. This variable measures the proportion of total-loans-to-total-deposits for the branch or the ability of the branch to meet its loan demands with deposits, i.e., its liquidity position. It illustrates how dependent a branch is on outside funds for loans. This variable ranged from .01 to 22.5, with ten of the branches having ratios greater than five. It appears that outside sources are providing ample funding for many of the branches. Other studies have reported the negative affects of outside funding on loan recovery [Christen, Von Pischke, 1980]. Thus, the larger the **LNS_TO_DEP** value, the poorer the branch's loan recovery experience and the more likely this variable will have a negative coefficient.

The branch's net income (**BR_NET_Y**) is the difference between gross income and gross expenses. In a well functioning system, to obtain a large net income a branch must recover a sizeable amount of the interest owed on its loans. But since interest income in Bangladesh is as based on the accrual method, i.e., reported income is based on earnings from both active and inactive loans in the branch's portfolio, the sign of **BR_NET_Y**'s estimated coefficient is expected to be positive. This variable does not directly have an effect on loan recovery; however, it does demonstrate why poor recovery can be ignored by lenders.

The sign of the variable for the ratio of operating-income-to-operating-expenses, **OPY_TO_OPEXP**, provides information on how policy should be directed toward income and expense issues. A negative coefficient suggests that in order to increase the dependent variable this variable should decrease in size. This can be accomplished by either decreasing the numerator (operating income), something most enterprises do not

wish to do, or by increasing the branches' operating expenses. Included in operating expenses are employee salaries and benefits, rents and depreciation, "lighting, insurance, stationary, telephone, postage, repairs and maintenance, business development expenses, remittance charges, and miscellaneous expenses" [Srinivasan and Meyer 1986, pp. 4-5]. The operating income of the branch represents non-interest income, i.e., from commissions, service fees, and miscellaneous income. Owing to a lack of other sources of income in the rural areas, it is not surprising that this income is low for rural branches, since their primary business is disbursing loans. This observation is further reflected in the loan-to- deposit ratio where almost half of the branches in the sample had a ratio greater than one and ten branches had ratios greater than five.

The final explanatory variable, **NETY_TO_GRSY**, is the ratio of the branch's net-income-to-its-gross-income. A negative estimated coefficient suggests that recovery performance can be increased by raising the branches' operating expenses, i.e., increase salaries, benefits and other costs part of which would be expected to be spent on loan recovery.

The Model

A model was developed to explain recovery performance using the variables listed above. The first four variables described in the previous section serve as alternative measures of recovery performance. The model was estimated by ordinary least squares. It was specified as follows (the expected signs of the coefficients are listed in parenthesis beneath the variables):

$$Y=b_o + b_1\#\_AG\_LNS + b_2AG\_LNS\_OUTS + b_3PERS + b_4BANKTYPE +$$
$$(?) \qquad (?) \qquad (+) \qquad (-)$$

$$b_5BR\_AGE + b_6BM\_EXP + b_7TARGET + b_8LNS\_TO\_DEP + b_9BR\_NET\_Y +$$
$$(+) \qquad (+) \qquad (-) \qquad (-) \qquad (+)$$

$$b_{10}OPY\_TO\_OPEXP + b_{11}NETY\_TO\_GRSY$$
$$(?) \qquad (?)$$

where Y is either one of the actual recovery amounts (**AG_VOL_COLL, TOT_VOL-_COLL**) or one of the collection ratios (**AG_REC_RATE, TOT_REC_RATE**). The models were tested for the presence of collinearity and heteroscedasticity, and both tests proved positive. The presence of collinearity was detected using the methodology set forth by Belsley, et. al.. This problem was remedied by utilizing the ridge regression option of **Shazam**'s OLS subroutine, as suggested by Johnston. The arbitrary constant, k, utilized in the ridge regression was selected at the level where the collinear coefficients of each model stabilized. Heteroscedasticity was handled by utilizing the square root value of each observation's variables in the models and by employing **Shazam**'s HETCOV option, which corrects for heteroscedasticity.

Results

The parameter estimates of the four ridge regression models are shown in Table 2. Most of the coefficients were significant at the 5 percent level of confidence and had the expected signs. The reported R-square values (between .43 and .32) are reasonable for this type of study. The remaining unexplained variation in loan recovery performance may be due to the lack of borrower information since the models only utilized bank level data.

Table 2
Ridge Regression Results of the Four Models Estimated*

	MODEL			
	AG_VOL_COLL	TOT_VOL_COLL	AG_REC_RATE	TOT_REC_RATE
CONSTANT	6.7033	3.4814	0.6252**	0.6771**
	(1.83)	(0.85)	(8.61)	(4.58)
#_AG_LNS	0.1265**	0.0894	-0.0345**	-0.0414**
	(5.74)	(1.23)	(-5.22)	(-6.17)
AG_LNS_OUTS	0.0899**	0.0873**	-0.006**	-0.0045**
	(10.2)	(7.75)	(-3.60)	(-2.62)
PERS	2.1637**	3.6305**	0.03**	0.0314**
	(5.03)	(6.83)	(3.30)	(3.14)
BANKTYPE	-3.438**	-4.0919**	-0.0344**	-0.0514**
	(-4.89)	(-4.53)	(-3.12)	(-4.43)
BR_AGE	1.3365**	2.8552**	0.04**	0.0382
	(2.70)	(4.03)	(1.97)	(1.71)
BM_EXP	0.5522	2.0417**	0.0483**	0.0483**
	(1.33)	(2.89)	(3.67)	(3.77)
TARGET	0.0269**	0.0265**	-0.0057**	-0.008**
	(3.95)	(2.89)	(-2.77)	(-3.42)
LNS_TO_DEP	0.9666**	1.2364**	-0.0591**	-0.0597**
	(3.34)	(3.55)	(-8.29)	(-7.84)
BR_NET_Y	0.0739**	0.1026**	0.0006	-0.0007
	(2.28)	(2.71)	(0.13)	(-1.19)
OPY_TO_OPEXP	-3.4307**	-5.3815**	-0.0801**	-0.0916**
	(-6.11)	(-6.72)	(-3.07)	(-3.36)
NETY_TO_GRSY	-3.143**	-2.758**	-0.1328**	-0.1132**
	(-2.9)	(-2.02)	(-5.10)	(-4.25)
R-Sq.	.43	.37	.32	.37
R-Sq, Adj.	.34	.27	.21	.27
$k^{@}$	.9	.7	.6	.5

*Results were obtained using the SHAZAM IBM-PC software program. Figures in parenthesis are t-ratio of the coefficients.

**Significantly different from zero at the 5% confidence level.

@Arbitrary constant required in the Ridge Regression procedure.

Branch collection performance, defined by the volume variables, was positively related to the number of agricultural borrowers, the volume of the agricultural loans outstanding, the loan target assigned to the branch, and the branch's loan-to-deposit ratio for 1984. Thus, when loan recovery is positive, more loans generate more loan recovery.

When recovery performance is defined as the ratio of loan payments received to loans disbursed, the coefficients of these same four variables change signs. Recovery performance decreases with an increase in the number of agricultural borrowers, the volume of the agricultural loans outstanding, the loan target assigned to the branch, and the branch's loan-to-deposit ratio. These findings support the argument that increasing the number of loans and loan volume disbursed hinders lending personnel from adequately administering loan portfolios. This implies that rural bankers in Bangladesh largely disburse and record rural loans, and then forget about them.

The coefficients of the remaining explanatory factors had their expected signs. The **BANKTYPE** coefficients were all negative, implying that NCB branches have a worse recovery position than do BKB branches. The positive sign of the **PERS**, **BR_AGE**, and **BM_EXP** variables imply that both the volume recovered and the collection ratio should increase with an increase in the number of personnel employed at a branch, with the age of the branch, and with the branch manager's years of experience.

The bank management efficiency variables were also significant for all four models. The results for the loan-to-deposit ratio variable suggest the need to generate more deposits relative to the volume of loans made in order to improve the loan collections. According to the results, an increase in branch net income should also increase the volume of loans recovered as well as improve its recovery rate. The results also suggest

that both the volume recovered as well as the collection ratios can be increased by reducing the operating-income-to-operating-expense ratio and the ratio of net-income-to-gross-income efficiency measures. Due to the limited income generating opportunities in rural areas, the operating income of most rural branches in Bangladesh are probably at their maximum levels. Since salaries are a major component of branch operating expenses, **OPY_TO_OPEXP** can be reduced by hiring more personnel [Srinivasan]. The **NETY_TO_GRSY** variable further supports this notion. By increasing labor expenses, a branch's net income should decrease but better recovery will cause the gross income reported by the branch to be realized income earnings rather than accrued earnings.

Similar results were reported by the TBAC study. Increasing gross income, lowering operating expenses, improving the salary scale, generating more deposits, expanding the loan portfolio and gaining more bank experience were associated with better collection results [TBAC, p. 96].

Concluding Comments

This paper presents the results of a model explaining rural loan recovery performance in Bangladesh using operating efficiency and several bank, manager, and loan characteristics as explanatory variables. Collection performance was evaluated for agricultural loans as well as for the total number of loans disbursed, because rural branches also offered non-agricultural loans. Loan recovery was measured as the total amount collected and as the ratio of the amount collected to the amount disbursed as of 31 December 1984. Models using the second definition were preferable since they provided more information, i.e., the success of the branch in recovering at least the amount of funds disbursed that year.

Better collection occurs at older branches and at those branches having managers with more banking experience. Based on this finding, bank's should institute a policy of assigning more experienced managers to rural branches, if the banks truly wish to increase loan recovery. Working against this recommendation is the perception by most bank officials in Bangladesh of being posted in rural branches as a form of punishment rather than as a reward. Perhaps this perception could be softened by offering more benefits to experienced managers assigned to rural branches.

Recovery levels should also increase by hiring more bank personnel for the rural branches. This recommendation is also supported by the significant negative signs of the coefficients for two of the policy variables, **OPY_TO_OPEXP** and **NETY_TO_GRSY**, which suggest that recovery can be improved by increasing the branches' operating expenses. Salaries presently account for the majority of these expenses.

At the national level, government intervention in lending procedures was found to impede the branch collection performance (i.e., the negative sign of the **TARGET**, **OPY_TO_OPEXP**, and **NETY_TO_GRSY** variables). The increased lending caused by supply-leading policies has surpassed the capacity of the branches to make and properly administer new loans, i.e., the volume lent has grown too fast for the number of personnel assigned to the branch [Ahmed]. Eliminating loan targeting programs, and allowing branch personnel to decide which economic activities and which borrowers to fund, should improve loan recovery. Also by eliminating interest rate ceilings, the lenders could charge borrowers interest rates that adequately reflect the lenders' costs of making and collecting loans, particularly the borrower's credit risks.

If loan recovery remains at its current low levels in Bangladesh, the viability of the formal financial institutions operating in rural areas will be undermined unless they are given continuous infusions of outside funds. Such a policy has been shown to undermine the development of rural financial markets and is counterproductive [Sanderatne]. A poor government, such as Bangladesh's, is not in a position to simultaneously subsidize a large number of borrowers. This hinders the income distribution objectives of the supply-leading policy and skews the distribution in favor of the more powerful members of rural society rather than the rural poor, the stated recipients of these loans.

Given the fact that only one year of data were used to test the model, these results must be considered tentative. The conclusions reached would be stronger if the data included the amount of loans coming due each year, the value of the portfolio's overdue loans, and branch deposit information for more than one year. However, the findings reported in the paper are consistent with the view that heavy government intervention in rural financial markets can hinder their development.

Table A

Dependent and Independent Variables Characteristics

VARIABLE	MEAN	MEDIAN	ST. DEV.*	RANGE
AG_VOL_COLL	980	569	16.06	26-11589
TOT_VOL_COLL	1,429	793	18.74	26-12691
AG_REC_RATE	0.49	0.29	0.34	.01-5.10
TOT_REC_RATE	0.50	0.34	0.32	.02-5.10
#_AG_LNS	739	482	13.40	0-3259
AG_LNS_OUTS	7005	4871	36.90	15-29721
PERS	12.4	11	0.71	4-35
BANKTYPE	0.72	1	0.46	0-1
BR_AGE	8	7	0.73	2-21
BM_EXP	6.5	6	0.77	1-18
TARGET	3687	1101	39.59	0-27772
LNS_TO_DEP	2.32	1	0.94	.01-22.487
BR_NET_Y	445.3	234	15.02	-198-7495
OPY_TO_OPEXP	0.52	0.24	0.42	0-3.72
NETY_TO_GRSY	0.18	0.18	0.33	-0.462-0.897
Ag. loans outstanding to total loans outstanding	0.85	0.95	0.13	.17-1

*The standard deviations are of the square-root transformed variables.

Source: Rural Bank and Bank Users Survey (RBBUS), Branch Manager Survey.

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